

Amendments to the Specification:

Please replace paragraph beginning at page 16, line 1, with the following rewritten paragraph:

--FIG. 5A is a graph showing an example of the codeword injected into the transmit path in accordance with an embodiment of the invention. The codeword is 16 bits in length and includes a pseudo random sequence of +/- "1"s commencing with bit P₀ referenced as 500 shown in a dotted pattern. This signal may be periodically injected by the PRN generator into a corresponding subscriber line transmit path for channel characterization.--

Please replace paragraph beginning at page 16, line 6, with the following rewritten paragraph:

FIGS. 5B-D show the leakage signal commencing at 502, a reflected signal commencing at 504, and the composite signal resulting from the leakage and reflected signals respectively which are effected on the receive path responsive to the injection of the codeword shown in FIG. 5A into the transmit path.

Please replace paragraph beginning at page 24, line 8, with the following rewritten paragraph:

-- ~~An apparatus and method is disclosed for channel estimation in an X-DSL communication device. The communication device may include physical or logical modems. The modems may implement one or more of a group of X-DSL protocols including: G.Lite, ADSL, VDSL, and HDSL. The apparatus may be used for determining the location and magnitude of discontinuities or faults within the communication medium to which the X-DSL communication device is coupled. The information provided by the device may be used for line qualification or repair. No additional equipment is required for channel estimation. Instead the apparatus may be located within a single modem or shared between a group of modems. An N bit pseudo random codeword injected into the transmit path is used to generate both a leakage signal and a plurality of reflected signals on the receive path. No~~

timing information is needed from the transmit path. Instead a unique correlator is utilized on the receive path to extract timing information for the reflected signals relative to the leakage signal. The broad bandwidth of the codeword and its relatively long duration allow channel estimation at significantly higher signal-to-noise ratios and with greater degrees of accuracy than heretofore possible. --